

DISCUSSION OF THE AMENDMENT

Due to the length of the specification herein, Applicants will cite to the paragraph number of the published patent application (PG Pub) of the present application, i.e., US 2006/0287461, when discussing the application description, both in this section and in the Remarks section, *infra*, rather than to page and line of the specification as filed.

Claim 1 has been amended back to its scope prior to the previous amendment, and is directed to the embodiment described in the specification at paragraph [0027]. Claims 11, 15 and 16 have been canceled.

New Claims 21 and 22 have been added, as supported in the specification at paragraph [0029].

No new matter is believed to have been added by the above amendment. Claims 1, 2, 4-9, 12-14 and 17-22 are now pending in the application.

REMARKS

Applicants thank the Examiner for the courtesy extended to Applicants' attorney during the interview held April 13, 2009, in the above-identified application. During the interview, Applicants' attorney explained the then-claimed invention and why it is patentable over the applied prior art. The discussion is now moot in view of the above-discussed amendment.

The rejection of Claims 1-2, 6 and 11-16 under 35 U.S.C. § 102(b) as anticipated by US 4,345,053 (Rizk et al), is respectfully traversed.

Above-amended Claim 1 is drawn to a process for preparing a silane-modified thermoplastic polyurethane, comprising reacting a thermoplastic polyurethane (TPU) with a silane which has an isocyanate group.

As previously noted, Rizk et al discloses a silicon-terminated polyurethane polymer and methods for making same, which method involves forming a polyurethane prepolymer by reacting an isocyanate with a hydroxy compound used in a molar excess with respect to the isocyanate component so that the resulting reagents have hydroxy terminals, and then reacting the polyurethane prepolymer with an organosilane compound having one or more hydrolyzable alkoxy silane groups (column 1, line 64 through column 3, line 8). As supported by the examples therein, reaction to form the polyurethane prepolymer is terminated when isocyanate can no longer be detected therein.

Rizk et al neither anticipates nor otherwise renders the present claims unpatentable because a polyurethane prepolymer is different from, and not suggestive of, a TPU, as now discussed.

As is well-known in the polyurethane art, TPU, as indicated by its name, is meltable, but solid material. Polyurethane *per se* (PU) normally is crosslinked and therefore not meltable, but also solid material (usually soft or hard foam, or solid blocks). Prepolymers are

short molecules and are **liquids**. They are mainly produced for linking toxic isocyanates, thus reducing toxicity, thereby making subsequent handling much easier. Depending on the number of isocyanate-groups and hydroxyl-groups of the prepolymers, they can react to thermoplastic polyurethane or crosslinked polyurethane. If the number of isocyanate groups per molecule is about two and the number of hydroxyl-groups of the polyol is about two as well these molecules will react to form a TPU. The single stranded TPU molecules are attached to one another by their isocyanates via Van der Waals bonding. This bonding is reversible, e.g., by temperature and therefore TPU is meltable. If there are statistically more than two isocyanate groups and/or hydroxyl groups in each isocyanate- polyol combination, the result will be a crosslinked PU. Prepolymers have a molecular weight of about 500 to 10,000, and are liquids, as stated above, while TPU (single stranded) molecules have molecular mass up to about 100,000.

The Examiner particularly relies on Example 3 of Rizk et al. In reply, and as discussed above, TPU are long single stranded molecules. Example 3 describes a prepolymer prepared from a mixture of 0.15 equivalent of a polyether diol with 0.077 equivalent of 4,4'-diphenylmethane diisocyanate. This statistically will lead to molecules with the ether in the middle and an isocyanate group at each end, which is not comparable with a TPU-molecule which has several isocyanate and polyol groups in one molecule (polymer versus monomer/prepolymer).

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1, 2, 6 and 11-16 under 35 U.S.C. § 102(b) as anticipated by US 5,990,257 (Johnston et al.), is respectfully traversed.

As previously noted, Johnston et al is similar to Rizk et al, which is described therein at column 1, lines 52-57, in that it involves the silylation of a polyurethane prepolymer, wherein the invention of Johnston et al involves (A) reacting (i) a polyol component having

terminal unsaturation less than 0.2 milliequivalents per gram of polyol, with (ii) a diisocyanate component at a stoichiometric excess of said polyol component to said diisocyanate component, whereby a polyurethane prepolymer is formed which is hydroxyl-terminated; and (B) reacting said polyurethane prepolymer with one or more isocyanate silanes having a formula as described therein (paragraph bridging columns 1 and 2). Thus, Johnston et al is deficient for the same reasons as Rizk et al since again, a silane is added to a prepolymer. Moreover, Johnson et al is concerned with coating materials; one skilled in the art would not look to Johnson et al for a new process for preparing a silane-modified TPU. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 4 and 7-9 under 35 U.S.C. § 103(a) as unpatentable over Rizk et al or Johnston et al, each in view of US 5,760,155 (Mowrer et al), is respectfully traversed. The Examiner relies on Mowrer et al for a suggestion of using the polyurethanes of Rizk et al or Johnston et al as a hose or cable sheath. However, even if the polyurethanes of Rizk et al and Johnston et al were used to form a hose or cable sheath, the result would still not be the presently-claimed invention. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 4, 7 and 17-20 under 35 U.S.C. § 103(a) as unpatentable over Rizk et al or Johnston et al, each in view of US 5,714,257 (Shah et al), is respectfully traversed. The Examiner relies on Shah et al as suggesting the use of the polyurethanes of Rizk et al and Johnston et al spun to give fibers. However, even if the polyurethanes of Rizk et al and Johnston et al were spun to give fibers, the result would still not be the presently-claimed invention. Accordingly, it is respectfully requested that the rejection be withdrawn.

The rejection of Claim 5 under 35 U.S.C. § 103(a) as unpatentable over Rizk et al or Johnston et al, each in view of Mowrer et al, and further in view of US 4,810,767 (Furukawa et al), is respectfully traversed. The Examiner relies on Furukawa et al as disclosing a

particular catalyst. However, even if the catalyst were used to cure the polyurethanes of Rizk et al and Johnston et al, modified by Mowrer et al, the result would not be the presently-claimed invention. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejection of Claim 5 under 35 U.S.C. § 103(a) as unpatentable over Rizk et al or Johnston et al, each in view of Shah et al, and in further view of Furukawa et al, is respectfully traversed. Even if the catalyst were used to cure the polyurethanes of Rizk et al and Johnston et al, modified by Shah et al, the result would not be the presently-claimed invention. Accordingly, it is respectfully requested that this rejection be withdrawn.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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